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ABSTRACT

This investigation describes a field test of the materials entitled "Reading: An Educational Approach to Disability" (READ), which were developed to aid disabled readers in the beginning stages of learning to decode English print. The subjects were 15 Title I reading teachers working in small groups with 183 second-grade children. The questions of interest were whether the READ materials, more effectively than games of traditional phonics, could teach students to decode short vowel trigrams and increase students' word recognition and reading comprehension skills. Results suggest that both the READ and the games programs were more effective than traditional phonics in developing students' ability to decode the meanings of written sentences and that the READ materials were more effective in developing the ability to decode unknown words in isolation for children in the lowest achievement subgroup. Revisions in the program prior to dissemination, followed by repeated validation study, are recommended. Tables illustrating the text are included. (Author/JM)

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READ: Field Test of an Educational Approach to Reading Disability

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ABSTRACT

This investigation describes a field test of the materials entitled, "Reading: An Educational Approach to Disability" (READ) which were developed to aid disabled readers in the beginning stages of learning to decode English print. The subjects were fifteen Title I reading teachers working in small groups with 183 second grade children.

The questions of interest were whether the READ materials, more effectively than Games or traditional phonics, could 1) teach students to decode short vowel trigrams, and 2) increase students' word recognition and reading comprehension skills.

Results suggest that both the READ and the Games programs were more effective than the traditional in developing students' ability to decode the meanings of written sentences, and that the READ materials were more effective in developing the ability to decode unknown words in isolation for children in the lowest achievement subgroup. Revisions in the program, followed by repeated validation study, are recommended prior to dissemination.

READ: Field Test of an Educational Approach to Reading Disability

The educational approach to reading disability assumes that remedial instruction should focus directly on the learner's difficulties in reading printed words. These difficulties have been reported elsewhere (Morsink, 1975) and might be summarized as follows:

1. poor perception of details in the pattern of a word
2. difficulty in association of sounds with symbols
3. difficulty in discriminating between words which look or sound alike
4. difficulty in combining sounds to make words
5. inability to remember words learned
6. difficulty in transferring learned skills to the reading of new words.

These problems may be compounded by a short attention span, a negative attitude, a tendency to perseverate and/or to attend to the wrong stimuli.

Reading: an Educational Approach to Disability (READ) is a series of remedial lessons designed (Morsink, 1972) to help disabled readers perceive the sound-symbol patterns which occur with greatest frequency in the English language, to recall these patterns and to apply this knowledge to the decoding of unknown words. This program was

adapted and expanded for disabled readers from a model originally proposed by McKee (1948) for normal learners.

READ structures lesson steps through analysis of sub-skills presumed to be involved in the learning of sound-symbol relationships. It provides instruction on one sound-symbol pattern in each lesson, using the following sequence of steps: Steps 1-3 - presentation of an overall structure for hearing, seeing, and associating the sound-symbol pattern introduced step 4 - associating the visual patterns of the target words with pictures; step 5 - selecting the correct visual pattern for the picture from a choice of two words (visual discrimination); step 6 - matching the auditory pattern with one from a choice of two spoken words (auditory discrimination); step 7 - substituting the visual pattern for the pattern in a known word to make a new word; step 8 - using the learned pattern together with picture and context clues to read unknown words; step 9 - testing by reading and spelling the words taught in the lesson without clues; step 10 - testing transfer by reading and spelling words with the same pattern.

This investigation attempted to determine the effect of Units I through V of the prototype READ materials, as compared with a traditional and a games approach, on the learning of three letter words containing short vowel sounds by second grade disabled readers in a

compensatory reading program. It also attempted to assess the effect of this learning on the students' word recognition and reading comprehension skills.

Procedures

Instrumentation. The Wide Range Achievement Test, Reading Subtest (WRAT-R, Jastak and Jastak, 1965) and the Peabody Individual Achievement Test, Reading Recognition and Reading Comprehension Subtests (PIAT, Dunn, 1970) were selected as norm-referenced measures of reading achievement.

The WRAT and the PIAT Recognition are tests which measure the subject's ability to decode isolated words. The PIAT Comprehension differs from the other two tests in that it presents words to be read silently, in sentence context, requiring the subject to point to the picture which best represents the meaning of the sentence read.

The READ Placement Test (READ, Morsink, 1972) was used as a criterion-referenced measure. The READ test is a measure of ability to read orally the ninety-one words taught in the READ lessons on short vowels. These are real words, all short vowel trigrams, sequenced in twenty-three word pattern lessons. The subject is required to read all words with a given pattern in order to receive credit for the lesson (for example, "pan, can, man, ran, fan" for lesson I-1). Since this

test was designed to place students in the program, and because each lesson's prerequisite was mastery of previous lessons, the test was terminated at the first error.

All tests were individually administered by the experimenter and a team of five graduate assistants from the University of Kentucky Regional Special Education Instructional Materials Center (UKRSEIMC). Raw scores, representing the number of correct responses, were used for all criterion measures.

Sample. Participating teachers and students were from a large school system in Central Kentucky. The sample was selected from among the second grade children receiving supplementary reading instruction as part of the district's compensatory reading program, funded through Title I of the Elementary and Secondary Education Act (ESEA). These children had been exposed to traditional reading instruction for at least one school year and their reading achievement (the previous spring) remained at or near the first grade level, as measured by the Stanford Achievement Test, paragraph meaning section. In this district, special reading teachers were assigned to buildings designated "Title I Schools." There were seventeen Title I teachers working with 257 children at the second grade level. Only fifteen of these teachers were eligible, since the other two met their classes three, instead of five, days per week.

Only children who scored lower than eighteen (the eighteenth lesson) on the READ test and whose grade equivalent scores were less than 2.5 on the WRAT and/or on the PIAT were included in the study. Characteristics of the 183 children who were selected and who remained in the district for the duration of the study are presented in Table 1.

Insert Table 1 About Here

Hypotheses. The first research questions asked about the effects of the READ program as compared with two other types of treatment on students' mastery of target words taught in the READ program. To answer this question, the following null hypothesis was formed:

1. There will be no difference in change over time among the regular, Games, and READ groups on the READ Placement Test (READ).

The second research question asked about the effects of the READ program when compared with two other types of treatment on student's growth in reading achievement. To answer this question, the following null hypotheses were formed: There will be no difference in change overtime among the Regular, Games and Read groups on:

2. The PIAT Recognition Subtest (PIAT-W)
3. The PIAT Comprehension Subtest (PIAT-C)
4. The WRAT Reading Subtest (WRAT-R)

Experimental Design. Because both research questions dealt with students' growth during the program, the Repeated Measures Analysis of Variance which measures change over time (Winer, 1962) was selected. The repeated measures design is a two-factor analysis of variance in which there are repeated measures (in this case pre and posttests) on factor B, the dependent variable. Each of the three treatment groups (factor A) is observed under both levels of factor B.

Factor AB is of greatest interest, since it measures the interaction between membership in a treatment group and change over time. This was the comparison designed to test the hypotheses, since it could answer the question, "Were there significant differences in pre-to-posttest growth among groups receiving different treatments?"

Randomization. Because the teacher was the smallest experimental unit which could be randomly assigned, teachers (not students) were the sampling unit (Glass and Stanley, 1970). Random assignments of teachers to experimental groups reduced the chances of treatment contamination due to teachers using more than one method, but also reduced the number of experimental units from 183 to 15. There was also one teacher who could not be randomly assigned. Her group was working in the Sullivan programmed series, and she was unable to change. She was therefore arbitrarily assigned, at her own request, to the control group.

Teaching Methods and Materials. For all students in the program, regular basal reading instruction, from a manual on their instructional level, was continued by the classroom teacher for approximately sixty minutes per day. In addition, all children received a daily thirty minute small group compensatory reading class from the Title I teacher. For twenty of the thirty minutes, this work concentrated on skill development which was a follow-up to the basal instruction (individualized help on workbook exercises, games and drills to develop word attack skills). The experimental component was implemented for the remaining ten of the thirty minutes by the Title I teachers, over a period of ten weeks.

Materials used in the ten-minute experimental component by the five regular (control) group teachers consisted of more of the same kinds of things which were used by all Title I teachers for the constant twenty-minute daily lessons. (See Appendix A)

The five teachers in the READ group (E_1) used the READ cards in twenty-eight lessons (twenty-three patterns, plus five reviews), according to the directions in the READ manual for teaching short vowel patterns. They followed the ten steps previously specified, and presented these steps individually on a series of flashcards, each designed to teach one of the steps for one of the target words. In addition to using the stimulus

cards, the READ teachers were taught to structure the learning situation for students by using hand and verbal signals to focus student's attention on the task. These were adaptations of the techniques designed for the DISTAR program by Englemann and Bruner (1969). The READ teachers did not use the supplementary games. Neither did they use other materials for practice on the words introduced. Any other instruction they gave on short vowels was a part of the regular instruction received by all children.

The five teachers in the Games group (E_2) taught exactly the same words as did the teachers in the READ group. They used cards from step four (only) of the READ card set to introduce the words. Then they provided practice on these target words by using three games - versions of Bingo, Go Fish, and Concentration. There were five sets of Bingo cards, one for each vowel sound, presented in the same order as the READ lessons. Go Fish was a matching game, in which children had to collect a series of words having similar word endings. Concentration stressed visual memory of letter patterns by requiring players to recall the location of matching cards turned face down. (See Appendix B)

Teacher Training. A three-hour teacher training workshop was held for all participants one week prior to implementation of the program. During the workshop, the importance of following procedures and of not discussing methods or materials with others in the

experiment was stressed. Each of the three groups met in turn with the experimenter to receive training in its respective procedures. All three groups were also told that positive reinforcement was an important factor in helping disabled readers to master new words.

Follow-up Observations. Unscheduled observations were made by the experimenter to all fifteen classrooms with a a two-week period after implementation of the program, and again beginning the sixth week of the program. During these observations, the experimenter gathered data on three variables for all teachers, as follows:

1. Was the teacher following procedures specified for her group?
2. Was the teacher spending the designated amount of time on her specified procedure?
3. Was the teacher using positive reinforcement for correct student responses?

The experimenter provided each teacher with a written report immediately following the observation period. The report contained statements of praise for following specified procedures.

Results

Hypothesis 1, that there would be no difference on the READ Placement test, (the criterion-referenced test) was not rejected.

The means and standard deviations for all fifteen teachers in the three treatment groups are presented in Table 2.

Insert Table 2 About Here

The interaction between group membership and occasion approached significance ($<.06$), suggesting that there may have been a relationship between membership in at least one of the treatment groups and growth in reading achievement as measured by the READ Test. This relationship is illustrated in Figure 1, which shows that the greatest growth in mastery of the READ words was achieved by the Games group, followed closely by the READ group.

Insert Figure 1 About Here

Of hypotheses 2, 3, and 4 (the norm-referenced tests), only hypothesis 3 was rejected. The interaction between group membership and occasion was significant for the PIAT-C ($<.027$). Mean differences and standard deviations for the three groups on the PIAT-C are presented in Table 3.

Insert Table 3 About Here

Figure 2 illustrates that the largest pre to posttest differences on the PIAT-C occurred in the READ group, followed closely by Games.

Insert Figure 2 About Here

Table 4 summarizes the univariate F ratios for hypotheses 1-4. This table shows that none of the overall (factor A) differences between groups were significant. The F ratios for occasion (factor B) were significant for all four dependent variables, indicating that students made significant growth during the program. For the PIAT-C Test, the interaction between group and occasion was significant ($<.027$) and for the READ test, the interaction between group and occasion approached significance ($<.06$), indicating that on at least one dependent variable, treatment interacted with time to produce gain which was significantly higher for at least one of the treatment groups. In both cases differences scores of the READ and Games groups were so close as to be negligible, while both were considerably higher than the Regular group. The nature of these interactions has been graphically illustrated in Figures 1 and 2.

Insert Table 4 About Here

Post Hoc Treatment by Levels. A post hoc research question asked about the effect of the READ materials as compared with the other two methods on the posttest reading achievement of students who were stratified into upper, middle, and lower levels upon entrance to the program.

Univariate F ratios for treatment-by-levels are presented in Table 5. This table indicates that the interaction between posttest score and treatment group was significant for the WRAT-R Test (<.043).

Insert Table 5 About Here

Means and standard deviations for treatment-by-levels on the WRAT-R posttest are presented in Table 6.

Insert Table 6 About Here

The null hypothesis, that there would be no interaction between group and posttest level for the dependent variables a) READ, b) PIAT-W, c) PIAT-C, and d) WRAT-R, was rejected for variable d) WRAT-R only. The nature of this interaction is shown in Figure 3, which suggests that, for the lower group the READ program was differentially beneficial, while for the middle and upper groups, the Regular program was more effective.

Insert Figure 3 About Here

In addition, although the F ratio was significant for hypothesis d) only, graphic representation of the data revealed a pattern of consistent superiority of the READ program with lower level students. This pattern is illustrated in Figure 4.

Insert Figure 4 About Here

DISCUSSION

Results of the repeated measures analysis indicated that the interaction between group membership and occasion on the Read Placement Test (READ) approached significance ($<.06$) and warranted further exploration. The significance test in this analysis is conservative, since it treats repeated measures as correlated variables. The nature of this interaction has been shown in Figure 1. It is apparent from this graph that students in both the READ and Games groups exceeded students in the Regular group in mastery of the READ words. The conclusion suggested by this finding seems, at first, all to obvious - "Students learn what teachers teach them." Students in both the READ and Games groups were given specific instruction in the decoding of short vowel trigrams, while students in the Regular group were given only general instruction in word recognition skills. Obviously the groups which were taught to decode the words on which they were tested would learn them better than the group which was not taught to decode the words.

Beyond the simplistic interpretation, however, lies the possible importance of the finding: for students similar to those in the population studied, direct instruction may be more effective

than indirect instruction. If this is true, then teachers who are interested in helping these students master certain words should specifically teach the target words, rather than teaching general rules and assuming that transfer of learning will take place. This finding would be consistent with the observations of Strauss and Lehtinen (1947), Cruickshank et al., (1960) and Johnson and Myklebust (1967) regarding the need of disabled learners for specific, direct instruction on skills in which they are deficient. The answer to research question 1 should be interpreted with great caution, however, since the null hypothesis was not rejected in the present study and the interaction only approached significance. This question should be raised again, following suggested revision of the READ test and the READ materials.

The obvious lack of significant differences on mastery of the READ words between the READ and Games groups has also been shown in Figure 1. This finding is equally interesting, since it suggests that, for the group as a whole, repeated exposure to the target words (as provided in the Games approach) may be just as effective as a highly structured lesson plan (such as READ) which breaks the learning steps into small components. If this is true, then one of the most important ingredients of an effective remedial program would seem to be repetition in conjunction with interest or motivation. This finding would support the need of disabled

readers for repeated practice, as emphasized in the works of Fernald (1943), Gillingham (1960), and Bryant (1965). The lack of significant differences between the READ and Games treatments in mastery of the target words also suggests a weakness in the READ program - the need for additional activities which provide repeated practice with the target words.

The significant interaction between group membership and occasion ($<.027$) on the PIAT-C has been illustrated in Figure 2. The largest pre to posttest difference occurred in the READ group, followed closely by Games. These differences were very stable, since each represented the mean of five nested teacher means for which standard deviations were small. It is possible that this specific word recognition instruction helped students increase their ability to decode the meanings of written sentences. Caution should be urged, however, in interpretation of this finding, since mean differences were extremely small and may reflect statistical significance, while being of questionable value educationally.

In the post hoc treatment-by-levels analysis, the significant F ratio for interaction between group and level on the WRAT-R test, and the consistency across norm-referenced variables suggested a greater effectiveness for the READ program with lower level students. This would be consistent with the finding of Putnam and Youtz (1973)

who suggested that a structured linguistic series was more effective than a basal reading series with beginning urban disadvantaged children in the lowest achievement subgroup. The pattern of results on the post hoc analysis would seem to suggest that students who began the program with the lowest levels of reading achievement responded better to the highly structured, carefully sequenced READ approach, while students who had already developed some reading skills did just as well as or better in programs which assumed a great deal of automatic transfer and incidental learning.

A careful examination of the characteristics of the lower level students in all three groups indicated that these children were unable to read any of the short vowel trigrams in the READ test upon entrance to the program. They functioned at the very lowest levels on the tests measuring recognition of isolated words (PIAT-W and WRAT-R), knowing only letter names and sounds and a few pre-primer sight words, such as "look", "play", and "jump". In addition, these children were totally unable to score on the PIAT-C test, either because their PIAT-W scores were too low to warrant administration of the more advanced subtest, or they didn't recognize enough sight words to be able to use them in conjunction with context for the purpose of comprehending printed sentences.

Children in the lower level, then were totally unable to decode words or sentences, while those in the middle and upper levels had already begun to master a few of the basic reading skills. It may have been that these lower level children were the only "disabled readers" in the study, while middle and upper level students represented less complicated remedial cases who could overcome their difficulties with maturation, given ordinary instruction.

The fact that lower level READ student perform consistently better than lower level Regular or Games students in decoding words which they had not been specifically taught suggests that instruction designed to help them recognize learned patterns in unknown words was helpful. This would be consistent with the component of Bruner's theory (1966) which emphasizes the learner's need to perceive new knowledge as a specific instance of a more general case and with Bryant's theory (1965) that disabled readers require specific instruction in forming generalizations and making transfers which seem to occur automatically in normal learners.

Need for Further Study. The nested design, in which teachers are the randomly assigned units, may have been a limitation of the study. A wide variation in posttest scores among teacher subgroups within treatments, shown in Tables 2 and 3, may suggest differences in teacher competence or enthusiasm

for method and may indicate the need for randomly assigning children rather than teachers during replication. Of particular interest are the unusually high scores for teacher one in the control group. This was the teacher using Sullivan (1967) as her "basal", which means that her students worked with consistent sound-symbol patterns for the full hour and a half per day, while those in the experimental groups received this type of instruction for ten minutes and "true basal" (sight approach, with incidental and supplemental phonics) instruction for one, twenty minutes. Sullivan, like READ, presents regularly spelled words in a structured sequence; unlike READ, it features a large amount of horizontal practice on word patterns. Its success with this population (although messing up the present study!) may strengthen the previous observation that disabled readers require instructional programming which features both structured sequence and a large amount of practice. Other teacher differences, which might account for variations in effectiveness, were also observed (Appendix C).

Problems encountered during the study suggest that the READ placement test should be revised to include a direct measure of student's ability to apply learned patterns (for example "at") to the reading of unknown words (for example nonsense trigrams like "lat" and two-syllable nonsense words like "gatsan"). And since the lack of activities for practice was found to be a possible weakness in the READ materials, the games designed for this study

should become a component of the READ program. Following revision of the test and the addition of games, another study should be conducted, taking its sample from children in the lowest reading subgroup. The whole "patterns" approach (READ, supplementing programmed or linguistic texts) should be compared to a whole word attack skills approach supplementing basal texts (for example, one of the criterion-based programs reviewed by Rude, 1974). This study should be of longer duration, with children assigned at random to method.

Conclusions. This study has shown that the READ materials are at least equal to traditional materials for phonics instruction when used as a daily ten-minute supplement for second graders in a compensatory reading program. It has provided some evidence that, for the lowest level of disabled readers, a sound-symbol pattern approach may be significantly better than traditional phonics instruction. If these results can be replicated, they will add support to the suggestion that the lowest achieving readers require a remedial program which is carefully structured, highly repetitive, and which teaches sound-symbol associations as patterns within the context of words. However, since the findings were statistically significant only for two variables, they can serve only to point out the need for future investigations. Repeated validation testing, with appropriate revision, is recommended prior to dissemination of the READ program.

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TABLE 1

DESCRIPTION OF SAMPLE BY EXPERIMENTAL GROUP ON CHRONOLOGICAL AGE, SEX, RACE, AND PRETEST SCORES FOR READ PLACEMENT TEST (READ), PEABODY INDIVIDUAL ACHIEVEMENT TEST-WORDS (PIAT-W), PEABODY INDIVIDUAL ACHIEVEMENT TEST-COMPREHENSION PIAT-C), AND WIDE RANGE ACHIEVEMENT TEST-READING (WRAT-R)

Characteristics	Regular Group	Games Group	READ Group
Age (months)			
Mean	97.83	94.79	95.63
S.D.	4.38	1.78	4.21
Range	93-104	92-96	90-102
Males	36	38	33
Females	25	30	21
Black	19	24	25
White	42	44	29
READ Mean	3.44	3.19	2.42
S.D.	2.36	1.32	0.67
Range	1.8-7.6	1.8-4.6	1.5-3.3
PIAT-W Mean	21.45	22.03	20.97
S.D.	0.96	0.60	0.61
Range	20.0-22.2	21.1-22.6	20.2-21.7
PIAT-C Mean	19.46	19.38	18.80
S.D.	0.94	1.33	0.53
Range	18.5-20.8	18.0-21.1	18.3-19.4
WRAT-R Mean	34.20	34.65	33.73
S.D.	2.19	1.96	1.54
Range	30.9-36.5	32.1-36.7	31.5-35.9

TABLE 2

MEAN PRETEST-POSTTEST DIFFERENCES AND STANDARD DEVIATIONS FOR THREE GROUPS ON THE READ PLACEMENT TEST

Teacher	Regular Group			Games Group			READ Group		
	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.
1	5	12.40	3.13	30	12.40	6.93	11	19.27	3.00
2	8	1.88	3.44	11	13.00	7.07	7	10.14	7.34
3	36	7.47	7.44	7	14.14	9.06	15	2.39	3.75
4	4	3.25	2.50	13	16.69	7.62	15	14.20	8.18
5	8	1.38	2.19	7	8.43	7.28	6	17.00	6.54
TOTAL	61	5.28	4.65	68	12.93	3.01	54	12.71	6.44

TABLE 3

MEAN PRETEST-POSTTEST DIFFERENCES AND STANDARD DEVIATIONS FOR THREE GROUPS ON THE PEABODY INDIVIDUAL ACHIEVEMENT TEST, COMPREHENSION SUBTEST

Teacher	Regular Group			Games Groups			READ Group		
	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.
1	5	3.40	1.67	30	4.27	2.66	11	3.64	1.75
2	8	1.25	0.89	11	3.14	3.20	7	3.14	2.12
3	36	1.75	3.36	7	2.69	2.19	15	3.40	1.84
4	4	2.13	1.26	13	3.00	1.65	15	1.93	1.79
5	8	3.10	1.89	7	3.64	2.08	6	4.50	2.81
TOTAL	61	2.10	0.80	68	3.24	0.60	54	3.32	0.93

TABLE 4

UNIVARIATE F RATIOS FOR REPEATED MEASURES: READE PLACEMENT TEST (READ), PEABODY INDIVIDUAL ACHIEVEMENT TESTS, READING RECOGNITION SUBTEST (PIAT-W), PEABODY INDIVIDUAL ACHIEVEMENT TESTS, COMPREHENSION SUBTEST (PIAT-C), AND WIDE RANGE ACHIEVEMENT TEST, READING SUBTEST (WRAT-R)

Source	Variable	df	MS	Univariate F	p less than
Between cells		5			
A (Group)	READ	2	807.5898	1.9639	0.1829
	PIAT-W	2	44.3176	0.7942	0.4744
	PIAT-C	2	82.4283	1.2443	0.3228
	WRAT-R	2	52.2786	0.2454	0.7863
B (Occasion)	READ	1	19768.2969	78.4469	0.0001*
	PIAT-W	1	2080.2637	134.1483	0.0001*
	PIAT-C	1	1415.7405	249.9521	0.0001*
	WRAT-R	1	6952.9063	166.6327	0.0001*
A x B	READ	2	878.5642	3.4864	0.0641
	PIAT-W	2	3.5264	0.2274	0.8000
	PIAT-C	2	28.0233	4.9476	0.0272*
	WRAT-R	2	34.4051	0.8245	0.4619
Within cells		12			
A (Group)	READ	12	411.2175		
	PIAT-W	12	55.8049		
	PIAT-C	12	66.2459		
	WRAT-R	12	213.0637		
B (Occasion)	READ	12	251.9960		
	PIAT-W	12	15.5072		
	PIAT-C	12	5.6640		
	WRAT-R	12	41.7259		
A x B	READ	12	251.9960		
	PIAT-W	12	15.5072		
	PIAT-C	12	5.6640		
	WRAT-R	12	41.7259		

* Indicates significance at $< .05$ level of confidence.

TABLE 5

UNIVARIATE F RATIOS FOR TREATMENT BY LEVELS: READ PLACEMENT TEST, (READ), PEABODY INDIVIDUAL ACHIEVEMENT TESTS, WORDS SUBTEST (PIAT-W), PEABODY INDIVIDUAL ACHIEVEMENT TEST, COMPREHENSION SUBTEST (PIAT-C) AND WIDE RANGE ACHIEVEMENT TEST, READING SUBTEST (WRAT-R)

Source	Variable	df	MS	Univariate F	p less than
Group(A)	READ	2	834.858223	14.89960	0.0001*
	PIAT-W	2	5.934507	0.72734	0.5109
	PIAT-C	2	26.703101	4.37390	0.0138*
	WRAT-R	2	12.72135	0.58694	0.5625
Level (B)	READ	2	833.616108	14.87744	0.0001*
	PIAT-W	2	206.944844	25.36349	0.0001*
	PIAT-C	2	214.710428	35.16904	0.0001*
	WRAT-R	2	1268.30896	58.51746	0.0001*
AxB	READ	4	107.789216	1.92370	0.1075
	PIAT-W	4	11.590280	1.42052	0.2280
	PIAT-C	4	7.967403	1.30504	0.2691
	WRAT-R	4	54.42696	2.51116	0.0428*
Residual	READ	174	56.032243		
	PIAT-W	174	8.159163		
	PIAT-C	174	6.105097		
	WRAT-R	174	21.67403		

* Indicates significance at $< .05$ level of confidence.

TABLE 6

POSTTEST MEANS AND STANDARD DEVIATIONS FOR THREE TREATMENT GROUPS STRATIFIED INTO UPPER, MIDDLE, AND LOWER LEVELS ON THE WIDE RANGE ACHIEVEMENT PRETEST, READING SUBTEST

Level	Regular Group			Games Group			READ Group		
	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.
Upper	5	51.40	6.02	17	47.94	5.78	9	44.33	6.12
Middle	48	41.42	5.52	36	39.86	4.05	32	41.00	3.45
Lower	8	34.38	3.02	15	34.60	3.91	13	36.15	3.41

FIGURE 1

RELATIONSHIP BETWEEN GROUP MEMBERSHIP AND MASTERY OF WORDS TAUGHT IN READ PROGRAM, MEASURED BY THE READ PLACEMENT TEST

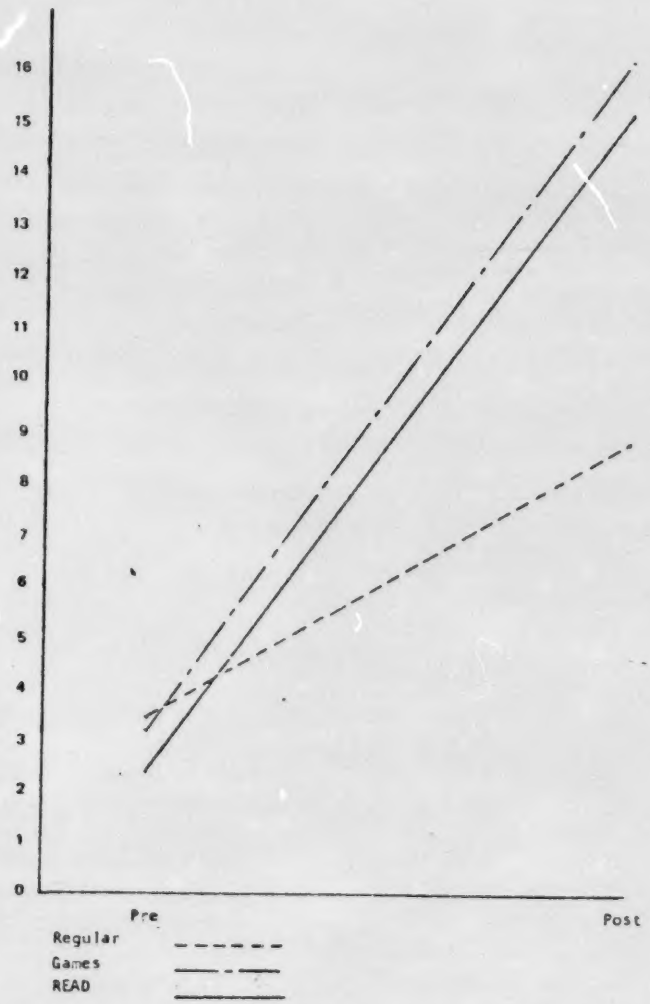


FIGURE 2

RELATIONSHIP BETWEEN GROUP MEMBERSHIP AND GROWTH IN READING ACHIEVEMENT AS MEASURED BY THE PEABODY INDIVIDUAL ACHIEVEMENT TEST COMPREHENSION SUBTEST

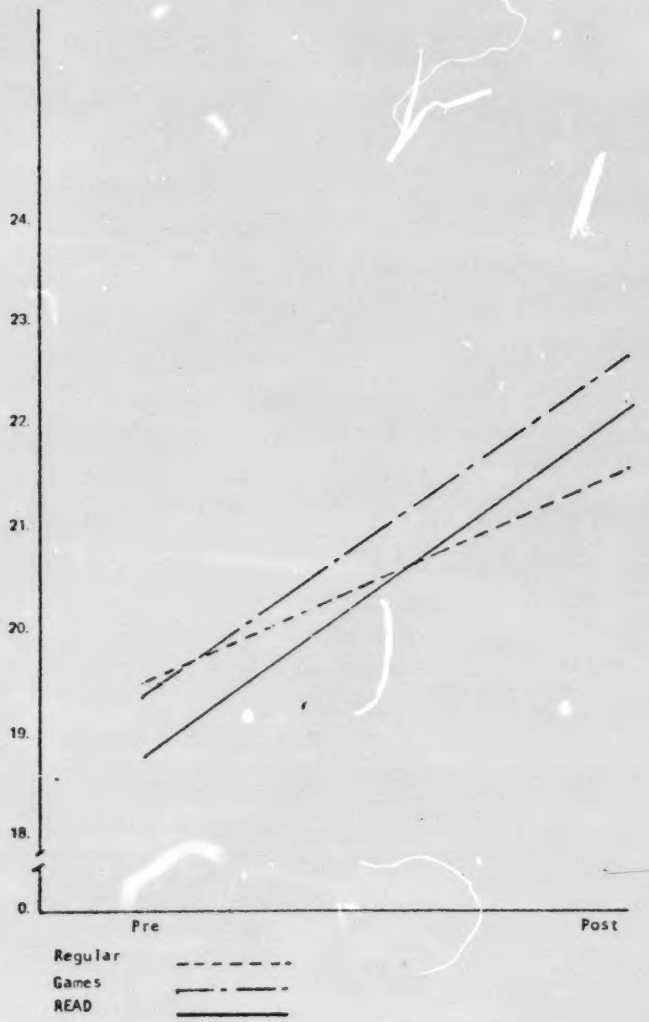


FIGURE 3

RELATIONSHIP BETWEEN POSTTEST ACHIEVEMENT ON THE WIDE RANGE ACHIEVEMENT TEST, READING SUBTEST, AND GROUP MEMBERSHIP FOR STUDENTS STRATIFIED INTO UPPER, MIDDLE, AND LOWER LEVELS ON THE BASIS OF PRETEST ACHIEVEMENT

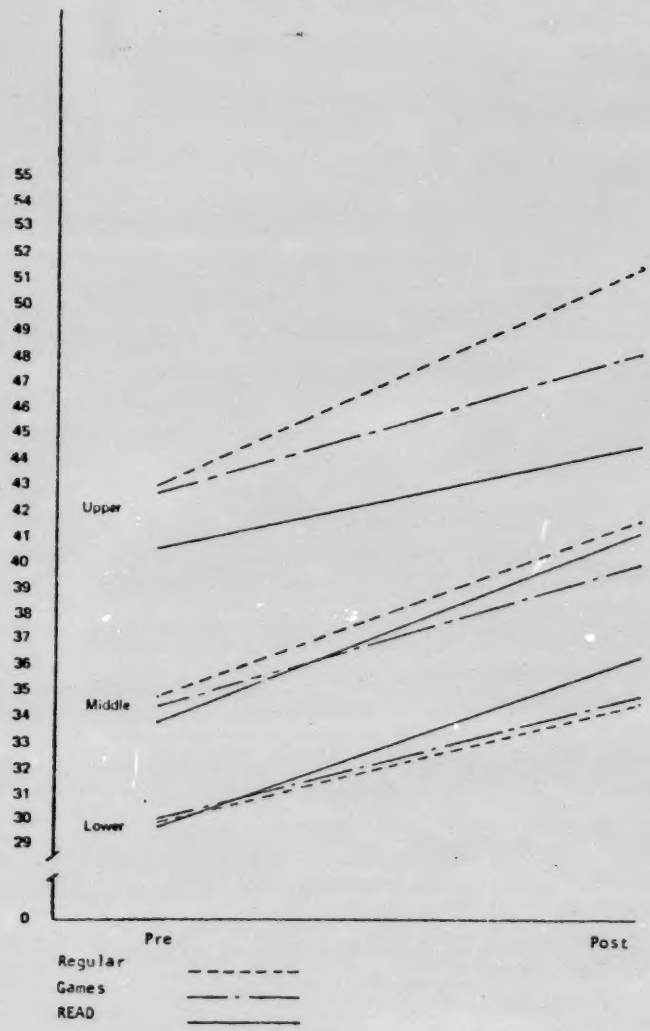
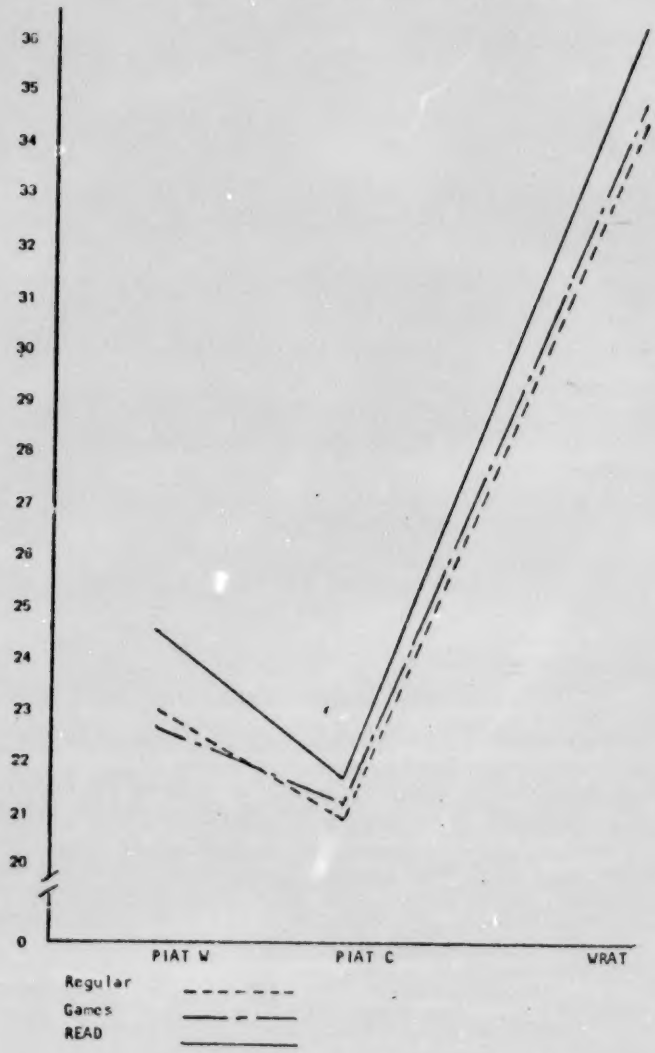


FIGURE 4

RELATIONSHIP AMONG POSTTEST MEANS ON THREE NORM-REFERENCED TESTS FOR LOWER LEVEL STUDENTS IN THREE GROUPS



Appendix A

Procedures Used by the Regular Group

Materials used by teachers in the regular (control) group consisted of "more of the same" kinds of things which were used by all Title I teachers for the constant thirty-minute daily period. These materials were designed to teach word recognition skills according to the guidelines in the teacher's manual of the basal series and/or consisted of teacher-made drills and games designed for the same purpose. Representative word recognition activities used by the five control group teachers included the following:

1. A series of teacher-made booklets in the shape of an animal representing a given vowel sound (a duck, for example, for the short u). Students were asked to fill in blanks to make a word with the short u sound, to draw pictures of rhyming words, to fill in beginning and ending sounds, and to use the short vowel words in sentences.

2. A collection of game-like activities, using paper bags labeled with different beginning consonant blends. In one case, the paper bags were adorned with pictures of circus tents and each consonant blend was represented by a different animal containing that blend in its name. Students were given two or more bags at one time, along with a series of pictures representing words which began with these consonant blends. The task was for the child to sort the pictures by beginning sounds, placing them into the correct bag.

3. Flashcard drills were used extensively by another teacher in the control group. She gave the students a number of word cards, having sight vocabulary words printed on them. Then, providing a

stimulus word, such as "cat", she asked her students to respond by reading the words in their hands which had the same beginning, ending, or middle sound as in the word "cat". Interest was added to the drill by dividing the group into teams and recording correct answers on a chart, represented by a picture of a rocket. The objective of each team was to send its rocket to the moon.

4. Another teacher used the Economy series for teaching phonics to her students. This series stresses vowels sounds both in one and two-syllable words. A common drill used by this teacher consisted of listing words with short and long vowel patterns on the board and asking student to apply learned rules by "sounding out" the words.

5. The fifth control teacher used the Reading series (Sullivan, 1967) as her basal and supplementary program for teaching word recognition skills. This is a programmed series, previously described. Basal readers used by students in the regular group, as well as in the other two groups are presented in Table 7.

Insert Table 7

TABLE 7

BASAL READERS USED BY STUDENTS IN THREE EXPERIMENTAL GROUPS

	Regular Group	Games Groups	READ Groups	TOTAL
Harper-Rowe	11	28	38	77
MacMillan	36	5	9	50
Scott Foresman	0	8	0	8
Rowe-Peterson	0	1	0	1
Bank Street	5	0	0	5
Sullivan BRL	5	0	0	5
Houghton-Mifflin	4	0	0	4
Ginn	0	25	7	32
Individualized	0	1	0	1
TOTAL	61	68	54	183

APPENDIX B

"Procedures Used by Games Group"

"GAMES" GROUP

LESSON STEPS FOR R.E.A.D. FIELD TEST

1. Begin on the first day with lesson I-1. Present the five words in this lesson to the group by using the word-picture cards. First show both the word and the picture. Then show only the picture and ask children to supply the word (cover word with one hand while doing this). Last, show the word while covering the picture, and have group read the word without picture clue. (cards B)

2. Test mastery of the words by presenting the card on which all words are written. Ask students to take turns reading these words. Then dictate the words, one at a time, for oral or written spelling. Child must read and/or spell all words correctly in order to go on to the next lesson.

3. Select one of the supplementary games to play if time allows. Always use the same words taught in today's lesson or those which have been taught before. Do not use new words.

4. On the second day, and every day after that, review the previous lesson before introducing the new words. Do this by showing only the words (card A, no pictures) and asking children to read them. If they miss any of these words, repeat the previous lesson before going on.

5. Record the information asked for on the data sheet each day.

6. On Mondays, and after vacations or snow days, take extra care to review previous material.

7. If only one or two in the group are having trouble, let them practice alone or with a partner while others are working on other activities. Do not hold back the entire group for one or two children.

APPENDIX B (cont'd)

GAMES FOR SUPPLEMENTARY PRACTICE WITH R.E.A.D.

1. BINGO: Give each child a player's card on which the words for the current unit are written. Take all word cards from that unit and shuffle them. Teacher (teacher or child) begin at top of deck and calls words one at a time. Children cover them on their player's card. Every child has every word on his card.

Child who calls Bingo must be able to read all of the words he has covered in order to win. Winner is the first to cover a whole row in any direction and to read it correctly.

Each card is marked with its unit (I, II, III, IV, V. R is review) Teacher will need to make cards for calling words on review unit. This can be done by copying the words from any player's card and shuffling them.

2. GO FISH: Shuffle together all cards from the unit on which you are working. Deal three cards to each player. Put all other cards face down in "fish" pile in center of table. First player asks any other person for a card matching a word family card in his hand. He asks by family name ("Give me all your . . . a-n."). Person must give all the cards he has in this family. If person asked does not have any cards in this family he says "Go fish" and player takes a card from "fish" pile.

Three or more cards in same family make a book. These are put on the table in front of each player. Person with most books wins game. In case of tie, person with most cards in books wins game (some books have three cards, some five).

3. CONCENTRATION: (Play with 2-6 lessons at a time) You will need all word cards for lessons used, plus matching cards from extra set marked "concentration extras."

Lay cards face down on table in rows. First player picks up any card and reads word. He then picks up any other card. If they match exactly, and he can read the word correctly, he gets to keep them and take another turn. If they do not match, he replaces cards in the same position from which they were drawn.

Each player puts pairs on table in front of him when he draws matching cards. When all cards are gone, winner is person with the most pairs. Object of game is to train concentration and memory.

APPENDIX C

TEACHER VARIABLES

It was obvious, from the data presented in tables on the READ and PIAT-C tests that there were large differences in achievement levels of students taught by different teachers. Additional tables (unpublished dissertation; Morsink, 1974) indicatedthat these differences were also present on the PIAT-W and WRAT-R variables.

For each of the four dependent variables, it was possible to identify the teachers whose students had demonstrated the highest and lowest raw score achievement gains during the experiment. This summary is presented below.

	Regular Group	Teacher Number	Games Group	Teacher Number	READ Group	Teacher Number
			READ Test			
highest	12.40	1*	16.69	9	19.27	11
lowest	1.38	5	8.43	10**	2.39	13**
group mean	5.28		12.93		12.71	
			PIAT-W Test			
highest	4.40	1	3.82	7	5.50	15
lowest	.75	5	1.43	10	2.73	13
group mean	2.99		2.88		3.91	
			PIAT-C Test			
highest	3.40	1	4.27	6	4.50	15
lowest	1.25	2	2.69	8	1.93	14
group mean	2.10		3.24		3.32	
			WRAT-R Test			
highest	8.80	1	6.00	7	8.91	11
lowest	3.38	2	2.29	10	4.80	13
group mean	5.89		5.22		6.90	

*consistently high
**consistently low

This table indicates that there was one teacher (regular group, #1) whose students' achievement was consistently high and two teachers (games group #10, READ group #13) whose students' achievement was consistently low. Records of observations (see attached observation form, in Table 8) in these classrooms were analyzed to identify any relationships between teacher behavior and student achievement. There were some apparent differences between what the most successful teacher was doing and what the two least successful teachers were doing.

Successful Teacher #1, as previously noted, taught students using the Sullivan materials, which differed greatly from the other "regular" (traditional basal) materials. The role of materials has already been discussed. In addition, this teacher's reading instruction was highly structured. It featured a great deal of overlearning in the patterns presented in Sullivan with an emphasis on application of learned skills to the total reading program. In addition, this teacher did not use extrinsic rewards for students (candy, tokens, etc.); she used verbal praise for correct responses.

Unsuccessful Teacher #10 used the READ games for a minimal amount of time, and confessed to often not using them at all in the experimenter's absence. Reading instruction in her groups was apparently based on the assumption that high interest material generated automatic skill acquisition. She supplied students with high-interest books (which they eagerly attempted to read, but) in which they miscalled a large percentage of the words.

She often introduced several skills at the same time, without providing opportunities for overlearning or application. She used an extrinsic reinforcement system, but like most of the other teachers, did not award candy or tokens contingently; instead she gave all student the reward at the end of the lesson, regardless of their performance.

Unsuccessful Teacher #13 went through the motions of presenting the READ lessons, but she did not maintain students' attention. She failed to state behavioral expectations, or to praise students who waited their turns or responded correctly; and she frequently "called down" those who shouted out answers. Like most of the other teachers, she used an extrinsic reinforcement program (candy, tokens), but in fact awarded these items noncontingently to all students at the end of the lesson. In addition, she made no attempt to demonstrate the relationship between the pattern words taught in the READ lesson and other words with similar patterns encountered in the basal readers. Like Unsuccessful Teacher #10, she introduced a variety of skills in the same lesson, but failed to provide adequate practice on any of them.

It seemed apparent, then, that there might have been some differences between the behaviors of the teachers whose students' achievement was highest and lowest. Among the teacher behaviors recommended for further study are the use of contingent reinforcement, the planning of single-concept skill lessons, the correlation of skill instruction with the total reading program, and the provision of overlearning on skills.

Insert Table 8

TABLE 8

Follow-up Observation

(IMC or cooperating school district supervisor should make at least five follow-up observation visits to teacher during teaching Units I-V)

Check Mark Indicates "Yes"

Observation 1	Observation 2	Observation 3	Observation 4	Observation 5
1. Teacher began lesson with review of previous material:				
2. Teacher presented individual steps of lesson correctly:				
3. Teacher presented all ten steps in correct sequence:				
4. Teacher used signals for look, listen, read, answer at right times:				
5. Teacher praised correct student signal responses and ignored others:				
6. Teacher used READ manual while presenting lesson:				
7. Teacher filled out daily evaluation form immediately following lesson:				
8. Teacher provided extra practice for children who didn't meet criteria:				

(Observations should be made during a regular, not a review lesson. Time of day should be pre-arranged with teacher, but exact date of visit should not be specified. Provide teacher with feedback on effective use of materials immediately following observation.)